

# Agenda

08:00-08:30: Coffee and informal introductions

08:30-09:00: Standards Overview: Bryan Gorman, Oak Ridge National Laboratory.

09:00-09:30: DHS-EIC Memorandum of Agreement and the Common Alert Protocol and EDXL: Elysa Jones, Chair, OASIS EM-TC.

09:45-10:15: IEEE 1451 Overview and Status: Kang Lee, Chair, TC-9 of the IEEE Instrumentation and Measurement Society.

10:30-11:00: OGC Web Services 3 (OWS3) and Sensor Web Enablement: George Percivall, OGC's Executive Director, Interoperability Architecture.

11:15-11:45: OGC Sensor Alert Service: Johnny Tolliver, ORNL and Chair of the OGC SAS standards group.

12:00-13:30: Lunch (dining facilities are available at the workshop location but will NOT be hosted).

13:30-14:00: Fort Bragg's Integrated Incident Management Center (I2MC). Greg Jackson, Ft Bragg Directorate of Emergency Services

14:15-14:45: Standards and a Consolidated 9-1-1 for Fort Bragg: John Halsema, Intergraph

15:00-15:30: Standards and a Commercial SensorNet Node for the DoD: Ryon Coleman, 3eTI

15:30-16:00: Wrap-up Discussion: All



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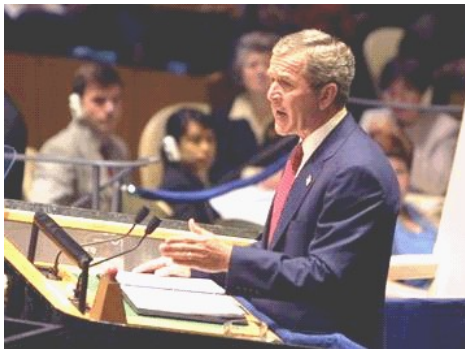
# Today's Objectives

1. What are the standards bodies doing to address sensor network standards?
2. How are ORNL and Fort Bragg participating in sensor network standards activities?
3. Is there a viable sensor network standards framework for industry today?
4. How will commercial developers and integrators support a sensor network framework for Fort Bragg's Integrated Incident Management Center?



# A Nation-wide Problem

- Most of the nation's public safety information infrastructure is comprised of “**stovepipe**” or “**island**” **networks** that can not and do not share information easily.
- Apart from *ad hoc* uses of the Internet and a few initiatives at the federal level, there is **no universally available, affordable data infrastructure** for public safety.



*“It is crucial for ... personnel to have and use equipment, systems, and procedures that allow them to communicate with one another.”*

The National Strategy for Homeland Security



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# The User Base

- Conservatively, in CONUS there are an estimated average **2,000,000 on-duty uniformed first responders and public safety** officials at any given time (not including National Guard)
- **17,000** local, state, and federal law enforcement **agencies**
- **35,000 fire departments** and emergency **medical** staffs



# Possible Solutions: Integration or Interoperability?

## Integrated Systems



**Tightly-coupled, fixed  
architecture**  
**Homogeneous system**  
**Autonomous or stand-alone**

Examples: Apple Macintosh, Amazon.com, Private Branch Exchange (PBX), Maneuver Control System (MCS), Land Mobile Radio (LMR) networks, systems integrators (e.g., SAIC, Boeing, Raytheon).

## Interoperable Systems



**Loosely-coupled, scalable  
architecture**  
**Heterogeneous components**  
**Standards-based interfaces**

Examples: IBM PC, eBay, Public Switched Telephone Network (PSTN), Net-Centric Enterprise Services (NCES), WiFi (802.11x) networks, open standards bodies (e.g., OASIS, OGC, IEEE) .



# Large Systems Integration Problems

**88%** of large information technology integration projects **fail or overrun** their target budgets by an average of **66%**

Standish Group, 1999

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## Problems revealed in FBI's software

S.D.-made key part could get scrapped

By Bruce W. Bigelow  
STAFF WRITER

January 14, 2005

The FBI said yesterday that it might scrap a program developed as a crucial element in a system required for the bureau to meet the

The customized software, which was intended to help FBI agents and analysts track terrorists and manage criminal investigations, was developed by SAIC, the San Diego defense contractor.

But the system's capabilities were only about 10 percent of what was sought, a senior FBI official told reporters yesterday in Washington, D.C. The official who conducted the review required anonymity as a condition for attending the news conference.

WASHINGTON (Dow Jones)--Big Pentagon weapons programs are rushed into production and often become unaffordable as a result, the Government Accountability Office said.

## GAO Questions Weapons Spending; Probes FCS, F/A-22 Plans

April 1, 2005: 13:20 p.m. EST

The Army's Future Combat Systems program, a massive modernization effort costing more than \$100 billion, and the Air Force's stealthy but expensive F/A-22 Raptor fighter stand out as two of the most vulnerable programs to cost overruns. The GAO's report, released Thursday, covers 54 major military weapons programs.

The GAO says the military services risk putting all of their eggs in too few baskets by pursuing ambitious projects aggressively. For example, the Army is now heavily dependent on Future Combat Systems and its lead contractor, Boeing Co. (BA).

Union-Tribune.

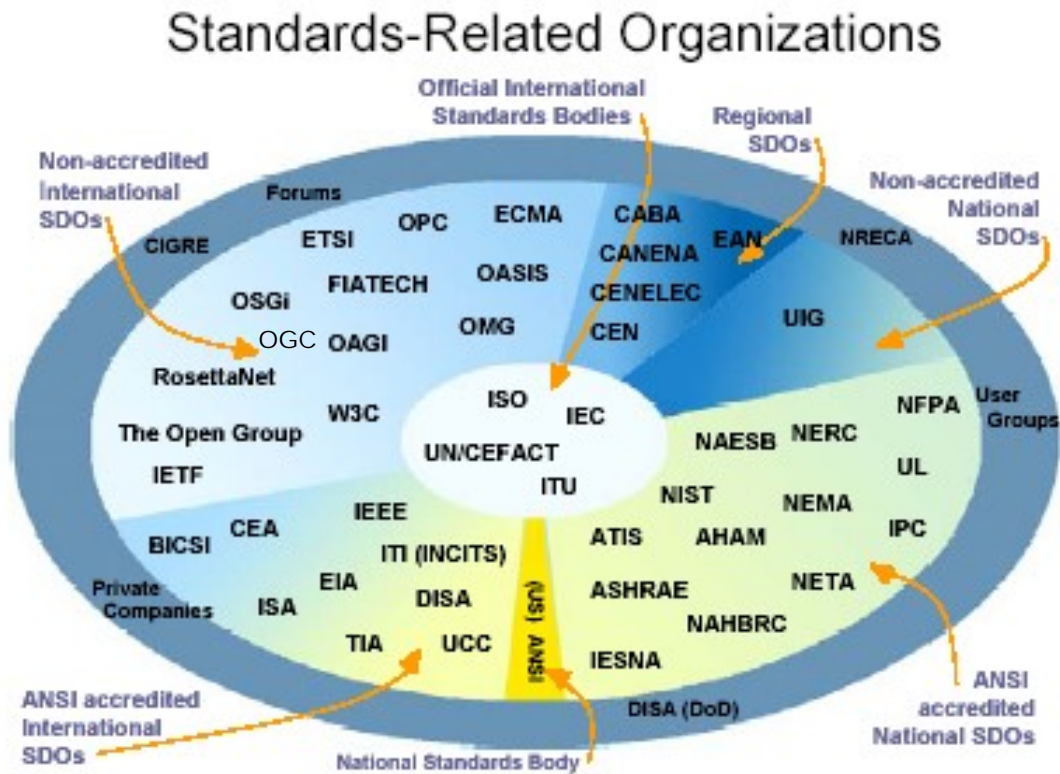


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# Standards Problems

## Which Standards Body?



# Standards Problems

(Some succeed and others do not)

TCP/IP

XML

Java

LDAP

IEEE 802.3/Ethernet

802.11x (WiFi)

SMTP

SNMP

OSI/TP4

CORBA

Ada

X.500

IEEE 802.5/Token Ring

ATM to the Desktop

isoEthernet

Home PNA/Home RF

X.400

TINA-C



# Some Common Sense Guidelines on What Works

1. **Small integration projects** are more likely than large integration projects to achieve their goals **on time and within or under budget**.
2. Technologies that are commercially available in the **competitive market place** are more likely to **achieve acceptance** as a standard than technologies that are not competitive.
3. A technology that addresses a **clearly-defined user requirement** and has the **advocacy** of its users is more likely to develop into a standard than a technology that has an undefined constituency.
4. An older technology that is already **an established standard will stay in place and improve** before it is replaced by a superior technology.
5. Although it is difficult to supersede a commercially available standard, a replacement technology that is **faster, cheaper, better** may succeed.
6. If a new standard can provide a **compellingly unique product or service**, it can still supersede an existing standard.



# A Methodology for Implementing Sensor Network Standards

*Design Large  
Design Collaboratively  
Develop Standards-based Middleware*



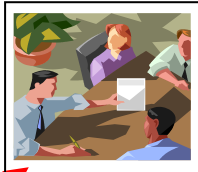
## Lab Activities

Research



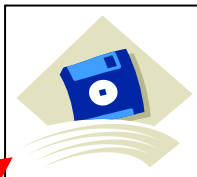
Sensor network architectures

Standards



Standards bodies establish international and open standards for sensor network interoperability

Development



A reference implementation of sensor network interoperability standards.

Engineering



Operational prototypes based on commercial technologies

Deployment



Deployment in testbeds that address user requirements

Tech Transfer



Commercialization of technology and standards

## Testbed Activities

*Build Small  
Build Many  
Collaborate to Commercialize*



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# What Will SensorNet Interoperability Standards Do?

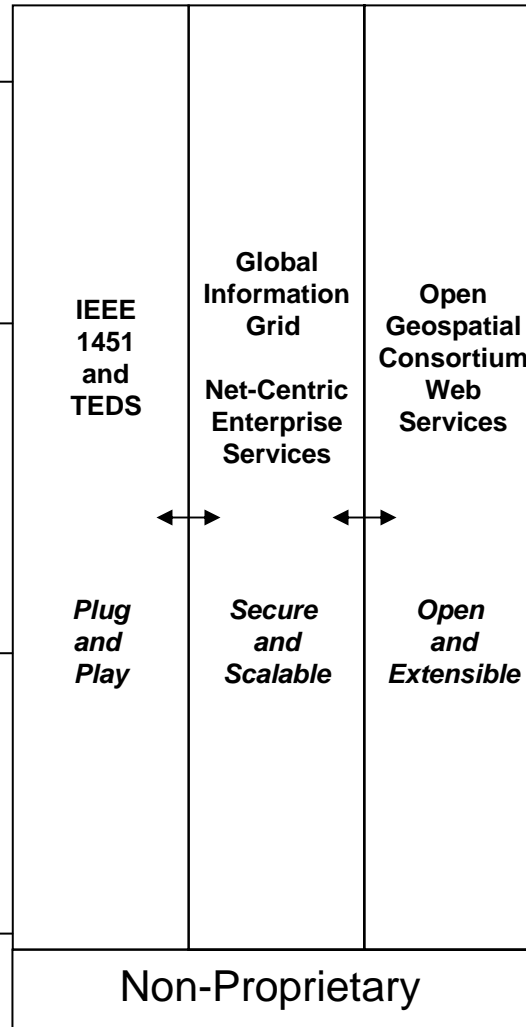
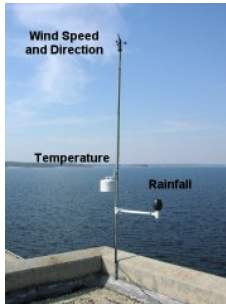
SensorNet interoperability standards will:

- enable the creation of a **national public safety backbone** comprised of autonomous, interoperable **local, municipal, and regional area sensor networks**;
- **reduce the time** to confirm, interdict, and respond to a threat, and **increase the number** of threats that can be detected by providing a common data schema for applications that detect, fuse, and analyze real-time readings simultaneously from multiple sensor sources;
- **increase competition** and **lower the costs** to deploy commercial sensor networks.



# A Framework for Standards-based Sensor Networks

## Many Sensors



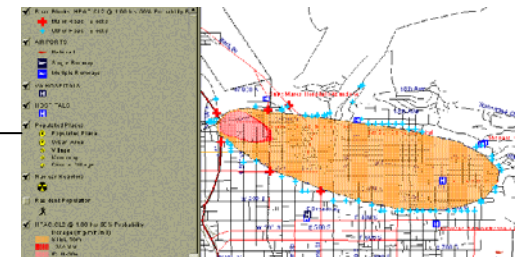
## Many Applications



Command-and-Control



Performance Support



Analysis, Modeling, and Prediction



# Fort Bragg's Integrated Incident Management Center (I<sup>2</sup>MC)

## Residential and Official Business Phone Customers



PSTN

National Emergency  
Standards Association  
(NENA)

Public Safety Answering Point

RF Network



First Responders  
Mutual Aid Incident  
Management (voice)

Association of Public-Safety Communications Officials  
(APCO)  
Project 25

IEEE 1451.x  
OGC SWE  
(Sensor Web Enablement)

SensorNet

Interoperability Standards

Mutual Aid Common  
Operational Picture  
Emergency Ops Center  
Situation Awareness  
Incident Management  
Subject Matter Expertise  
Collaboration

CAP  
DMIS  
EDXL  
EPAD  
NCES

OGC GeoDSS  
APCO Project 36

Global Info  
Grid

DMIS  
Interoperability  
Backbone

ComCARE  
Alliance

Intrusion Detection/Surveillance Systems  
Alarms  
CBRNE and Met Sensors  
Visitor Registration Systems  
Mass Notification Systems

